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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/540,474	06/23/2005	Manabu Matsui	0445-0354PUS1	2979

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EXAMINER	
STEELE, JENNIFER A	
ART UNIT	**PAPER NUMBER**
1794	

NOTIFICATION DATE	DELIVERY MODE
09/15/2009	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

Office Action Summary	Application No.	Applicant(s)
	10/540,474	MATSUI ET AL.
	Examiner	Art Unit
	JENNIFER STEELE	1794

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 July 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,4-8,10 and 11* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,4-8,10 and 11* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 7/6/2009 has been entered.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

1. Claim 1, 4-8, 10-11 rejected under 35 U.S.C. 103(a) as being unpatentable over Horiuchi et al (US 5,800,230) in view of J. Karger-Kocsis, Institute for

Composite Materials "Polypropylene An A-Z reference" in further view of Martin et al (US 5,733,825). Claims 1 and 7 as amended are described in the table below.

Claim 1	Claim 7
heat fusible conjugate fiber produced by	heat fusible conjugate fibers
	comprising two components having different melting points
	formed by heating fusible conjugate fibers and fusing the intersections of the fibers and
	wherein the bulky nonwoven fabric has having a specific volume of 95 cm^3/g or more
	a strength per basis weight of 0.18(N/25 mm)/(g/m^2) or higher,
High speed melt spinning and after the spinning	by high-speed melt spinning, after spinning
a heat treatment or a crimp treatment	a heat or crimp treatment
But no drawing	But no drawing
which comprises a first resin component having an orientation index of 40% or higher	comprise a first resin component having an orientation index of 40% or higher
a second resin component having a lower melting or softening point than the melting point of the first resin component and an orientation index of 25% or lower,	a second resin component having a lower melting or softening point than the melting point of the first resin component and an orientation index of 25% or lower,
the second resin component being present on at least part of the surface of the fiber in a lengthwise continuous configuration,	the second resin component being present on at least part of the surface of the firer in a lengthwise continuous configuration,
wherein said fiber has negative heat shrinkage values at a temperature higher than the melting point or softening point of the second resin component by 10°C,	wherein said fibers have negative heat shrinkage values at a temperature higher than the melting point or softening pint of the second resin component by 10°C,

increases in length upon heating	increase in length upon heating,
wherein the heat fusible conjugate fibers are staple fibers of 30-70 mm in length	wherein the heat fusible conjugate fibers are staple fibers of 30 to 70 mm in length.

Horiuchi teaches a bulky nonwoven fabric and a method of manufacturing the filament nonwoven fabric which is made of conjugated filaments (ABST).

Horiuchi teaches a process of making a conjugate filament including the steps of spinning the conjugated filaments by a spun bond method, blowing the webs by a high-speed flow against a scavenging device and removing the blown high-speed flow from the device, carrying out a preliminary bulkiness treatment; adding crimps and bulkiness (col. 2, lines 35-45). The bulkiness treatment is a heat treatment that is a hot air through treatment at a temperature between the melting point of the low melting point polymer and that of the high melting point polymer (col. 2, lines 60-64). Horiuchi teaches high speed melt spinning followed by a heat treatment. Horiuchi does not teach that the filaments are drawn.

In example 1, Horiuchi teaches a low melting point polymer of high density polyethylene and a high melting point polymer of polypropylene spun through a conjugated spinning device, where the temperature was 260°C for the sheath section and 320°C for the core section. Horiuchi teaches a spun non-drawn filament was pulled by high-speed flux type sucking and removal device at 3000m/min and was blown against the net conveyor along with air flux. The blown air flux was sucked and removed by the high-speed flux sucking and removal device at the bottom of the net conveyor. The blown air flux is called a preliminary bulking treatment and the air can be

at a higher temperature. Then the floating web heat through air treatment was carried out at 144°C. As the current application teaches high speed melt spun filaments have take up speed of 2000m/min, Horiuchi teaches a speed that is equated with high speed of claim 1.

Horiuchi teaches a first resin and a second resin wherein one has a higher melting point and the other has a lower melting point and the difference in melting points is at least 15°C (ABST).

Horiuchi differs from the current application and does not teach the property of negative heat shrinkage. Horiuchi teaches a filament with the property of bulking when subjected to heat treatments. Horiuchi teaches the heat treatment with the through air type device is preferable to improve bulkiness (col. 7, lines 10-11). Bulking is equated with increasing in dimension and therefore meets Applicants claim limitation of a negative shrinkage. While, Horiuchi does not teach the fibers increase in length, Horiuchi teaches the fibers bulk, which is an increase in dimension and therefore it is presumed the length of the fiber increases and the property of an increase in length is inherent to the bulking fiber of Horiuchi.

Horiuchi teaches the low melting point polymer, which is equated with the second resin, is on at least one section of the filament surface (ABST).

Horiuchi differs from the current application and does not teach the resin property of orientation index.

Horiuchi teaches a high melting point resin and a low melting point resin and teaches the resin properties of melt index and crystallinity (col. 8, lines 41-47). Horiuchi

does not teach orientation index. Orientation index is defined by Applicant to be the ratio of the drawn fiber birefringence over the instrinsic birefringence. The birefringence of a drawn fiber is dependent on the melt spin processing parameters, evidenced by the reference "Polypropylene, An A-Z Reference". Birefringence is dependent on the spinning take up velocity as found on page 431 which shows birefringence as a function of take-up velocity of a melt spun filaments. As the reference teaches, optimizing the spinning take up velocity would change the orientation index of the resultant fiber. Therefore birefringence and the orientation index is a result-effective variable of the spinning process. As Applicant teaches a high speed process, the claimed orientation index would result from this process or could be optimized to obtain the desired property. While the intrinsic birefringence of the resins employed in the invention could be compared to prior art resins, the property of orientation depends on the process parameters and Examiner will presume that the orientation index as claimed would be a result of employing the resins and process of Horiuchi.

Horiuchi differs from the current application and does not teach the filaments are cut into staple fiber of 30-70mm in length. While it is known in the art to cut filaments into staple length fibers, Martin is referenced for teaching it is known to cut multicomponent melt extruded filaments that are not drawn and are heat bonded together to form a low bulk density mat or pad.

Martin teaches undrawn bondable thermoplastic multicomponent filaments (ABST). Martin teaches the filaments are melt bonded together to form a lofty, open, low bulk density mat or pad (col. 7, lines 41-45). Martin teaches the filaments are

produced from two polymer components having a first and second melting point where the second component melting point is lower than the first component. Martin teaches the filaments are made from a melt extruding the filaments through orifices (col. 5, lines 14-25). Martin teaches the filaments can be in the form of fibers, ribbons, tapes, strips, bands and can be solid, hollow, or porous and straight or helical, spiral, looped, coiled, sinuous and then can be made in short discontinuous or staple form of definite length (col. 5 and 6, lines 56-67 and 1-15). Martin teaches alternatively the continuous filaments can be cut into staple length fibers for example 2.5 to 10 cm in lengths (25 to 100 mm) which is in the claimed range. Martin teaches the staple fibers can be bonded in aggregation as a substrate for cleaning and polishing pads.

As to claim 1, it would have been obvious to obtain a conjugate filament that does not shrink when heat is applied motivated by Horiuchi's conjugate filament and method of making a filament that increases in bulk when a heat treatment is applied. It further would have been obvious to measure the orientation index of the resins produced by the process of Horiuchi and determine that the claimed orientation index would produce the bulky conjugate fiber. One of ordinary skill in the art could have combined the polymer resins, process and process parameters of Horiuchi with the knowledge that the orientation index could be optimized by the spinning process parameters as taught in "Polypropylene" reference with a reasonable expectation of success in producing a conjugate fiber that increases in length when heat is applied. One of ordinary skill in the art could have cut the filaments of Horiuchi into staple fiber lengths motivated to produce an open, low density web.

As to claim 4, Horiuchi teaches a sheath core conjugate fiber.

As to claim 5, Horiuchi teaches the first resin comprises polypropylene and a second resin of high-density polyethylene (col. 8, lines 41-45).

As to claim 6, Horiuchi teaches a nonwoven web wherein the conjugate fibers are thermally fused together at the intersections (col. 2, lines 44-45). Horiuchi does not use the term carded web. A carding process is defined in the Textile Glossary, as “A machine used in the manufacture of staple yards. Its functions are to separate, align and deliver the fibers in a sliver form and to remove impurities. The machine consists of a series of rolls, the surfaces of which are covered with many projecting wired and metal teeth.” Horiuchi teaches the spun fibers are blown against a scavenging device before the heat treatment (col. 6, lines 40). Horiuchi also teaches the web can be drawn through pinch rollers applied in multiple stages, can be opened by rotating a roller having a plurality of needle-shaped protrusions or the like. This process is substantially the same as the claimed carding process. Process limitations in claims are not limited to the manipulations of the recited steps, only the structure implied by the steps. "In re Thorpe , 227 USPQ 964, 966 (Fed. Cir. 1985).

Where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a *prima facie* case of either anticipation or obviousness has been established. *In re Best,* 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977). "When the PTO shows a sound basis for believing that the products of the applicant and the prior art are the same, the applicant has the burden of showing that they are not." *In re Spada,* 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990). Therefore, the *prima facie* case can be rebutted by evidence showing that the prior art products do not <u>necessarily</u> possess the characteristics of the claimed product. *In re Best,* 562 F.2d at 1255, 195 USPQ at 433. See also *Titanium Metals Corp. v. Banner*, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985)

As to claims 7 and 8, the rejection over claim 1 over Horiuchi in view of "Polypropylene" and Martin is stated in the paragraph above. As claim 7 includes the additional limitations of specific volume, strength per basis weight and bulk softness per unit thickness, these limitation are addressed as follows.

Horiuchi teaches the specific volume of the nonwoven as measured with a 2 g/cm^2 load and versus a 54 g/cm^2 load described in Applicants specification. The specific volume of Horiuchi is calculated by the thickness (mm)/basis weight x 1000 (col. 7 and 8, lines 60-67 and 1-21). As the Horiuchi measurement has a lower load, the thickness would be greater and result in a different value than Applicant's claims and the Examiner can not determine if the properties can be equated. Horiuchi teaches a relationship between strength and the specific volume in the formula below. Therefore Horiuchi teaches that formula requires the fabric have a specific volume of 15-35 cc/g to achieve the desired strength.

$$Y \geq -1.25X+125 \qquad (1)$$

wherein Y is the geometrical mean of vertical and horizontal strength per 5 cm wide and 1 g/cm^2 nonwoven fabric [unit: g/(g/m^2·5 cm]; $Y=(MD \times CD)^{1/2}$ where MD is vertical strength [unit: g/(g/m^2·5 cm] and CD is horizontal strength [unit: g/(g/m^2·5 cm]; and X=specific volume of a nonwoven fabric [unit: cc/g].

Applicant's claimed properties of specific volume, strength and bulk softness are measured when a 2 gm/cm^2 load was added to a sample. This is a different test measurement than Applicant's as Applicant uses a 12 square cm plate with a weight of

54 grams. A comparison of the measurement can not be made. As the combination of Horiuchi, "Polypropylene" and Martin teach the structural and process limitations of the claimed invention, it would have been obvious to one of ordinary skill in the art to optimize the materials and process parameters to achieve the claimed properties. When the reference discloses all the limitations of a claim except a property or function, and the examiner cannot determine whether or not the reference inherently possesses properties which anticipate or render obvious the claimed invention the examiner has basis for shifting the burden of proof to applicant as in In re Fitzgerald, 619 F.2d 67, 205 USPQ 594 (CCPA 1980). See MPEP § 2112- 2112.02

As to claim 8, Horiuchi teaches a nonwoven web wherein the conjugate fibers are thermally fused together at the intersections (col. 2, lines 44-45). Horiuchi does not use the term carded web. A carding process is defined in the Textile Glossary, as "A machine used in the manufacture of staple yards. Its functions are to separate, align and deliver the fibers in a sliver form and to remove impurities. The machine consists of a series of rolls, the surfaces of which are covered with many projecting wired and metal teeth." Horiuchi teaches the spun fibers are blown against a scavenging device before the heat treatment (col. 6, lines 40). Horiuchi also teaches the web can be drawn through pinch rollers applied in multiple stages, can be opened by rotating a roller having a plurality of needle-shaped protrusions or the like. This process is substantially the same as the claimed carding process. Process limitations in claims are not limited to the manipulations of the recited steps, only the structure implied by the steps. "In re Thorpe , 227 USPQ 964, 966 (Fed. Cir. 1985).

Where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a *prima facie* case of either anticipation or obviousness has been established. *In re Best,* 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977). "When the PTO shows a sound basis for believing that the products of the applicant and the prior art are the same, the applicant has the burden of showing that they are not." *In re Spada,* 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990). Therefore, the *prima facie* case can be rebutted by evidence showing that the prior art products do not necessarily possess the characteristics of the claimed product. *In re Best,* 562 F.2d at 1255, 195 USPQ at 433. See also *Titanium Metals Corp. v. Banner*, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985)

As to claim 10, Horiuchi teaches a take up speed of 3000m/min in example 1.

As to claim 11, Horiuchi teaches the fibers are not drawn. Horiuchi teaches crimps may be formed right after the spinning process without the preliminary bulkiness treatment (col. 5, lines 49-51). The bulkiness treatment is a heat treatment. Horiuchi is teaching crimping without a heat treatment.

Response to Arguments

2. Applicant's amendments and arguments filed 7/6/2009 with respect to claim 7 and 8 have been considered but are moot in view of the new ground(s) of rejection. Applicant amended claim 7 to add limitations from independent claim 1 and the 35 USC 102/103 rejection over Horiuchi is withdrawn. A new 35 USC 103 rejection over Horiuchi in view of "Polypropylene" and Martin is presented over claims 7 and 8 in this Office Action.

3. Applicant's amendments and arguments filed 7/6/2009 with respect to claim 1, 4-6 and 9-11 have been considered but are moot in view of the new ground(s) of

rejection. The 35 USC 103 rejection has been revised to add the additional reference to Martin which teaches the new claim limitation of staple fibers of 30-70 mm length.

4. Applicant's arguments with respect to Horiuchi are not persuasive. Applicant argues that Horiuchi US '230 is not subjected to a heat treatment until the nonwoven fabric is actually prepared. Examiner respectfully disagrees. US '230 teaches the fibers are produced by high speed melt extrusion followed by a preliminary bulkiness treatment and then a heat treatment is performed (col. 5, lines 36-41). US '230 teaches the preliminary heat bulkiness treatment is a high speed flux suction interrupted zone which introduces air at a relatively high temperature around 41°C-180°C is used. This process is equated with Applicant's claimed heat treatment. US '230 also teaches a heat treatment method of hot air through is carried out at a temperature between the melting point of the low melting point polymer and the melting point of the high melting point polymer and thus produces a filament nonwoven web having good bulkiness (col. 6, lines 17-23). The process of US '230 is equated with Applicant's claimed heat treatment as Applicant teaches through air bonding (Table 4).

Examiner can not find reference in Applicant's specification to a separate heat treatment other than the through air bonding heat treatment listed in Table 4 (page 18 of the specification). As US '230 teaches a heat treatment of through air bonding which is the same heat treatment as taught by US '230, the rejection is maintained over US '230 as teaching substantially the same process which would result in substantially the same product. Table 1 list the spinning parameters and measurement for the heat shrinkage and then the fusion bond strength but there are no heat treatment steps or parameters

listed. As Table 4 presents the through air bonding conditions, it is presumed that this is the heat treatment as claimed. This heat treatment also bonds the fibers into a nonwoven web. The claims do not exclude the heat treatment to be one which is different from the heat bonding process (or through air bonding process) and therefore the argument is not commensurate with the scope of the claims.

5. Applicant argues that one of the reasons nonwoven fabric US ‘230 becomes thick is that fiber shrinkage occurs along the horizontal direction and as a result, the density of the nonwoven fabric becomes larger than it was before the heat treatment. It is not clear how Applicant has arrived at this conclusion. Applicant submits that the use of the term bulky in US ‘230 does not imply that the specific volume is small, as presently claimed but rather than the fabric become thick. As recited in the rejection, the method of measuring the specific volume (which is the inverse of density) in the current Application is based on an evaluation of bulkiness where a plate of weighing 54 g is used versus the 2 g/cm^2 load was added to a sample in US ‘230. The 54 g plate is 12 cm-side square so the weight of the plate is 0.37 g/cm^2 load compared to US ‘230 2 g/cm^2 load. A comparison can not be made as the test methods are different. A heavier load would compress the sample more and result in a greater density and lower specific volume. A lighter load as in Applicant’s test method would achieve a less dense material which would have the higher specific volume. The burden is on the Applicant to show that the invention as claimed is different from US '230. A measurement of the claimed fabric versus the invention of US '230 could show that the

resultant fabrics are the same or different. Or a measurement of the claimed fabric with a 2 g/cm^2 load could also show that the claimed invention is different.

6. Applicant argues the rejection over Horiuchi and “Polypropylene” and states the article "Polypropylene” discloses orientation indexes in general and does not teach obtaining a fiber that exhibits a negative heat shrinkage by controlling the orientation index of each polymer in a conjugate fiber. The reference to the “Polypropylene" article shows that the orientation index is a function of the polymer as well as the processing parameters and one of ordinary skill in the art could understand that the orientation index can be optimized.

While the article does not teach the property of negative heat shrinkage, “The discovery of a previously unappreciated property of a prior art composition, or of a scientific explanation for the prior art’s functioning, does not render the old composition patentably new to the discoverer.” Atlas Powder Co. v. Ireco Inc., 190 F.3d 1342, 1347, 51 USPQ2d 1943, 1947 (Fed. Cir. 1999). The basis for a negative shrinkage value is based on the scientific principle that materials expand when exposed to a higher temperature and contract when exposed to a lower temperature. The expansion (or negative heat shrinkage as claimed) in the presence of heat could be predicted by one of ordinary skill in the art.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JENNIFER STEELE whose telephone number is

(571)272-7115. The examiner can normally be reached on Office Hours Mon-Fri 8AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rena Dye can be reached on (571) 272-3186. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/J. S./
Examiner, Art Unit 1794

/Elizabeth M. Cole/
Primary Examiner, Art Unit 1794

9/10/2009